

REMARKS

Claims 1-10 were pending in the present application. Claims 1, 3, 5, and 7 stand rejected. Claims 2, 4, and 6 are objected to. Claims 8-10 are withdrawn from consideration as drawn to a non-elected invention. This response amends Claims 1, 4, and 5. No claims are added or canceled. Accordingly, Claims 1-7 are currently under consideration.

Claim 4 has been amended to correct a typographical error. Claims 1 and 5 have been amended for further clarity. The amendment to Claim 5 is supported, for example, at ¶ 51 in the specification. No new matter has been added. Amendment of these claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented.

Specification

The specification was objected to as requiring an update at ¶ [0001] of the current status of US Patent Serial No. 09/902,960, filed July 10, 2001. As the Office suggested, this response amends ¶ [0001] by inserting “now US Patent 6,690,025.” Hence, Applicants request withdrawal of the objection to the specification.

Claim Objections

Claim 4 was objected to for reciting “the mask of load structures mask” (emphasis added), which appeared to the Office to be grammatically incorrect. As the Office suggested, the second occurrence of “mask” (a typographical error) has been deleted. Hence, Applicants request withdrawal of the objection to Claim 4.

Claim Rejections Under 35 USC § 112, Second Paragraph

Claim 5 was rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office alleged that it was unclear whether the term “cladding” in Claim 5 referred to the bottom cladding recited in Claim 1 or to a new cladding layer.

Claim 5 has been amended for further clarity to recite “a top cladding.” Hence, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112, second paragraph.

Claim Rejections Under 35 USC § 103(a)

Claims 1, 3, 5, and 7 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Ono et al. (US 6,553,164) in view of Chandross et al. (US 6,002, 823). Applicants assume that the reference to “US 6,003,823” in § 9 of the Office Action is a typographical error, as US 6,002,823 is listed in the Notice of References Cited.

In order to show a *prima facie* case of obviousness, each and every feature of the claims must be taught or suggested by the cited references. See MPEP §2143.03. Claim 1 distinguishes over the combination of Ono et al. and Chandross et al. at least by reciting a method of manufacturing a planar light-wave circuit comprising:

forming a mask of optical waveguides defining at least one optical waveguide pattern on a core material ...; and
forming a mask of load structures defining at least one etch load pattern on the core material such that a total surface area of both the optical waveguide mask and the load structure mask cover at least approximately 25% of a surface area of the core material. (emphasis added)

Neither of the cited references teaches either “forming a mask of load structures defining at least one etch load pattern” or a total coverage by the optical waveguide mask and the load structure mask of “at least approximately 25%.”

The present application defines a load structure “as a structure, usually comprising the core material, which remains after the etching process removes the mask material and the unmasked core material.” (§ 15) The etch load patterns defined by the load structures are distinct from and in addition to the waveguide patterns. (§ 15, ¶ 41) That is, the load structures are additional structures separated from and not forming a part of the optical waveguides. For example, Figure 3A shows an arrayed waveguide grating (AWG 1) comprising a pattern of optical waveguides 30_{1-N}, 32, 34_{1-P}, 36, and 38_{1-N}. Figure 4A shows an AWG 1 comprising the optical waveguides shown in Figure 3A and, in addition, a plurality of load structures 46 that are separate and distinct from the pattern of optical

waveguides. In some variations, such use of load structures may improve etch selectivity as well as dimensional control of the waveguides of the planar light-wave circuit. (¶ 16).

The Office cites Chandross et al. as allegedly disclosing “a planar light-wave circuit (PLC) having a cladding layer (22), core layer (33) and pattern mask.” (Office Action, § 9). Chandross et al. does not disclose, and is not alleged by the Office to disclose, either “forming a mask of load structures defining at least one etch load pattern” or a total coverage by the optical waveguide mask and the load structure mask of “at least approximately 25%.”

The Office alleges, however, that Ono et al. discloses “forming a mask (37) (read on mask of the load structure) defining at least one etch load pattern on the core material (35) (See Fig 3D-4A).” (Office Action, § 9). The Office also alleges that Ono et al. further discloses that “the mask (37) and the mask of optical waveguide (39) complete cover the surface area of the core material (35) (i.e. 100%, See Fig 3D, read on ‘at least approximately 25% of a surface area of the core material).” (Office Action, § 9). Applicants respectfully submit that the Office has misinterpreted Ono et al.

Ono et al. discloses a process for manufacturing a Y-branch waveguide. (col. 7, lines 15-18). In this process, a lower cladding layer 33a is formed on a substrate, a core film 35 is formed on cladding layer 33a, and a film of etching mask material 37 is formed on core film 35. (Figures 3A-3C, col. 7 lines 15-34). A resist pattern 39 is formed on etching mask material 37, the portion of the mask material not covered by the resist is etched away, and the resist is removed. (Figures 3D, 4A, and 4B, col. 7 lines 35-40). The remaining etching mask material forms a patterned etching mask 41. (col. 7, lines 38-39 and 41). Waveguide pattern 43 (having the desired Y-branch structure) is then formed in core film 35 by etching core film 35 through patterned etching mask 41. (Figure 4C, lines 41-44).

The Office incorrectly alleges that Ono et al.’s etching mask material 37 defines “at least one load pattern on the core material” as recited in Claim 1. As explained above, etching mask material 37 is patterned (Figure 3D-4A) to form etching mask 41, which defines a waveguide pattern 43. Nothing in Ono et al. teaches or suggests that etching mask material 37 be patterned to

additionally form a mask of load structures that define an etch load pattern as recited in Claim 1 and discussed above. In particular, the plan views of Ono et al.'s Figures 1, 2, and 5 show waveguides but do not show load structures or an etch load pattern as recited in Claim 1 and discussed above.

Ono et al. does not disclose a total coverage of a surface of core material by an optical waveguide mask and a load structure mask of "at least approximately 25%," as recited in Claim 1, at least because Ono et al. does not disclose a "load structure mask." Moreover, the 100% coverage allegedly identified by the Office appears to refer to the unpatterned etch mask material 37 shown in Figure 3D, which at that stage does not even define a waveguide pattern.

Thus, the cited references do not teach or suggest every feature recited in Claim 1. Claims 2-7 are directly dependent on Claim 1 and distinguish over the cited combination of references for at least that reason. Hence, Applicants respectfully request withdrawal of the rejections under 35 USC § 103(a).

Allowable Subject Matter

The Office helpfully pointed out that Claims 2 and 6 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and that Claim 4 would be allowable if rewritten to overcome the objection discussed above under "claim objections" and to include all of the limitations of the base claim and any intervening claims.

The assistance of the Office is appreciated, but Applicants respectfully note that Claims 2, 4, and 6 are directly dependent on Claim 1 and hence distinguish over the cited reference in their present form.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 373722002110. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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